



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1430  
Alexandria, Virginia 22313-1430  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,420	10/19/2000	Hooman Darabi	39385/CAG/B600	2204

7590 07/18/2006

CHRISTOPHER C. WINSLADE  
MCANDREWS, HELD & MALLOY  
500 W. MADISON STREET  
SUITE 3400  
CHICAGO, IL 60661

EXAMINER

MILORD, MARCEAU

ART UNIT	PAPER NUMBER
----------	--------------

2618

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/692,420	<b>Applicant(s)</b> DARABI ET AL.	
	<b>Examiner</b> Marceau Milord	<b>Art Unit</b> 2618	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 62-74 is/are allowed.
- 6) ☒ Claim(s) 1-15,23-35,44-54 and 75-81 is/are rejected.
- 7) ☒ Claim(s) 16-22,36-43 and 55-61 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1- 15, 23-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali (US Patent No6590943 B1) in view of Hornak et al (US Patent No 567822).

Regarding claims 1-8, 11, 13, 15, Ali discloses a filter circuit (fig. 7), comprising: a plurality of cascaded filters (OP1, OP3 of fig. 7; col. 6, lines 20-33; col. 6, lines39-44)

However, Ali does not specifically disclose the feature of a bypass circuit coupled across one of the cascaded filters, and a plurality of cascaded filters wherein the bypass circuit comprises a switch, wherein the cascaded filters each comprises a biquad filter.

On the other hand, Hornak et al, from the same field of endeavor, discloses a time-share mixer circuit and a frequency converter, an I-Q modulator, and an I-Q demodulator. A switching signal drives the time-share mixer circuit to alternate between two output signals (col. 6, lines 22-51). Furthermore, Hornak shows in figure 19, a filter that receives the signal from the output

Art Unit: 2618

port of the time-share mixer. The filter comprises a plurality of cascaded RC filter stages and a sample-and-hold element. The first RC filter stage includes a resistor that receives the signal and couples it to an input of an amplifier. A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor and a capacitor 289 to the input of the amplifier. Similarly, the second filter stage includes a resistor that receives the signal from the first filter stage and couples it to an input of an amplifier (col. 19, lines 16-36). A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor 297 and a capacitor 299 to the input of the amplifier 293. The third filter stage includes a resistor that receives the signal from the second filter stage and couples it to an input of an amplifier. A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor 307 and a capacitor 309 to the input of the amplifier 303. The output from the third filter stage is provided to the sample-and-hold element and thence to the A-to-D converter. The sample-and-hold element is controlled by the switching signal source (figs. 17-19; col. 18, line 45- col. 19, line 24) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Hornak to the system of Ali in order to cascade multiple stages of input filter circuitry to customize the control system for specific frequencies and amplitudes of the signals to be filtered.

Regarding claim 9, Ali as modified discloses a filter circuit (fig. 7), comprising: a plurality of cascaded filters wherein the filters each comprises a pole and a zero (col. 7, line 22- col. 8, line 54).

Regarding claim 10, Ali as modified discloses a filter circuit (fig. 7), wherein the filters each comprise a complex filter with a pole and a zero (col. 6, lines 54-60).

Art Unit: 2618

Regarding claim 12, Ali as modified discloses a filter circuit (figs. 7), wherein at least one of the feedback resistors is programmable (col. 6, lines 23-44).

Regarding claim 14, Degenhardt as modified discloses a filter circuit (fig. 7), wherein at least one of the feedback capacitors is Programmable (col. 6, lines 21-31)

Regarding claims 23-28, Ali discloses a filter circuit (fig. 7), comprising: a plurality of filters (OP1, OP3 of fig. 7; col. 6, lines 20-33; col. 6, lines 39-44).

However, Ali does not specifically disclose a bypass means for bypassing at least one of the cascaded filters, wherein the bypass means comprises a switch coupled across one of the cascaded filters; wherein the bypass means comprises a plurality of switches each being coupled across a different one of the cascaded filters, wherein the switches each comprises means for being individually controlled; wherein the cascaded filters each comprise a biquad filter.

On the other hand, Hornak et al, from the same field of endeavor, discloses a time-share mixer circuit and a frequency converter, an I-Q modulator, and an I-Q demodulator. A switching signal drives the time-share mixer circuit to alternate between two output signals (col. 6, lines 22-51). Furthermore, Hornak shows in figure 19, a filter that receives the signal from the output port of the time-share mixer. The filter comprises a plurality of cascaded RC filter stages and a sample-and-hold element. The first RC filter stage includes a resistor that receives the signal and couples it to an input of an amplifier. A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor and a capacitor 289 to the input of the amplifier. Similarly, the second filter stage includes a resistor that receives the signal from the first filter stage and couples it to an input of an amplifier (col. 19, lines 16-36). A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a

Art Unit: 2618

capacitor 297 and a capacitor 299 to the input of the amplifier 293. The third filter stage includes a resistor that receives the signal from the second filter stage and couples it to an input of an amplifier. A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor 307 and a capacitor 309 to the input of the amplifier 303. The output from the third filter stage is provided to the sample-and-hold element and thence to the A-to-D converter. The sample-and-hold element is controlled by the switching signal source (figs. 17-19; col. 18, line 45- col. 19, line 24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Hornak to the system of Ali in order to cascade multiple stages of input filter circuitry to customize the control system for specific frequencies and amplitudes of the signals to be filtered.

Regarding claim 29, Ali as modified discloses a filter circuit (fig. 7), wherein the filters each comprise means for generating a pole and zero (col. 7, line 22- col. 8, line 54).

Regarding claim 30, Ali as modified discloses a filter circuit (fig. 7), wherein the filters each comprises a complex filter, the complex filters each comprising means for generating a pole and zero (col. 7, line 22- col. 8, line 54; col. 6, lines 54-60).).

Claims 30-35 contain similar limitations addressed in claims 10-15, and therefore are rejected under a similar rationale.

#### Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2618

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claim 44 is rejected under 35 U.S.C. 102(e) as being anticipated by Ali (US Patent No 6590943 B1).

Regarding claim 44, Ali discloses a filter circuit (fig. 8), comprising: a biquad filter; and a polyphase filter (86 of fig. 8) coupled to the biquad filter (col. 6, lines 38-47).

#### Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole

would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali (US Patent No 6590943 B1) in view of Becker et al (US Patent No 5612975).

Regarding claims 45-46, Ali discloses everything claimed except the features of a plurality of biquad filters including the biquad filter; and a plurality of polyphase filters including the polyphase filter, the biquad filters being intertwined with the polyphase filters.

However, Becker et al shows in figure 2, a first sampler that produces a digital first sampler output where the first sampler output is resampled by a controllable digital filter, and this filter is a multirate polyphase filter capable of either rational resampling or interpolation, or a variable rate polyphase filter capable of a continuously variable resampling at any continuous interpolation and/or decimation. In addition, the digital sampler output stream is supplied to each input of a plurality of interpolators of the polyphase filters (col. 5, lines 42-65; col. 6, lines 18-44; col. 10, lines 20-48). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Becker to the communication system of Ali in order to use polyphase filters that can provide low order anti-aliasing filtering and a reduction in the sampling rate.

7. Claims 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali (US Patent No 6590943 B1) in view of Becker et al (US Patent No 5612975) as applied to claims 44-45 above, and further in view of Hornak et al (US Patent No 567822).



Regarding claims 47-48, 52, Ali and Becker disclose everything claimed except the features of a bypass circuits that comprise a switch.

However, Hornak disclose a switching signal that drives the time-share mixer circuit to alternate between two output signals (col. 6, lines 22-51). Furthermore, Hornak shows in figure 19, a filter that receives the signal from the output port of the time-share mixer. The filter comprises a plurality of cascaded RC filter stages and a sample-and-hold element. The first RC filter stage includes a resistor that receives the signal and couples it to an input of an amplifier. A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor and a capacitor 289 to the input of the amplifier. Similarly, the second filter stage includes a resistor that receives the signal from the first filter stage and couples it to an input of an amplifier (col. 19, lines 16-36). A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor 297 and a capacitor 299 to the input of the amplifier 293. The third filter stage includes a resistor that receives the signal from the second filter stage and couples it to an input of an amplifier. A switching element, driven by the switching signal from the port of the mixer circuit, alternately connects a capacitor 307 and a capacitor 309 to the input of the amplifier 303. The output from the third filter stage is provided to the sample-and-hold element and thence to the A-to-D converter. The sample-and-hold element is controlled by the switching signal source (figs. 17-19; col. 18, line 45- col. 19, line 24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Hornak to the modified system of Becker and Ali in order to cascade multiple stages of input filter circuitry to customize the control system for specific frequencies and amplitudes of the signals to be filtered.

Claims 49-51, 53 contain similar limitations addressed in claims 11-15, and therefore are rejected under a similar rationale.

8. Claims 75-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hornak et al (US Patent No 5974306) in view of Birleson (US Patent No 6714776 B1).

Regarding claims 75-81, Hornak et al discloses a method of complex filtering (figs. 1-2) to extract a signal in a frequency spectrum comprising: a plurality of channels, comprising: rejecting an image of the signal in the selected channel (col. 5, lines 38-57; col. 6, lines 16-28; col. 11, lines 28-55) and applying gain to the signal, the applied gain being programmable (col. 5, lines 38-57; col. 6, lines 16-28; col. 11, lines 28-55).

However, Hornak et al does not specifically disclose the step of selecting one of the channels having the signal.

On the other hand, Birleson, from the same field of endeavor, discloses a system and method for a single conversion tuner which generally uses phase shifted in-phase and quadrature-phase signal paths as an image rejection circuit. The feedback loop may use a test signal to monitor the phase error between the in-phase and quadrature circuit paths, and may correct for the phase error by shifting the phase of the LO signal sent to one or both of the broadband mixers. The feedback loop thus generally corrects for any phase errors introduced by the image rejection circuitry. In addition, selected channel and image channel are centered about LO frequency (col. 2, lines 53- col. 3, line 24). The two components of the test signal are lower test tone, which is slightly lower in frequency than image channel, and higher test tone, which is slightly higher in frequency than image channel. The gain control voltages are used to adjust the gain of I amplifier and Q amplifier to equalize the gain of the I and Q signal paths (fig. 4; col.

Art Unit: 2618

8, lines 36-67;col. 10, line 50-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Birleson to the system of Hornak in order to provide a tuner input signal that can be split into its I and Q components, shifted in phase, and recombined to enforce the desired signal while suppressing the image signal.

#### Allowable Subject Matter

9. Claims 62-74 are allowed.

#### Allowable Subject Matter

10. Claims 16-22, 55-61, 36-43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### Response to Arguments

11. Applicant's arguments with respect to claims 1-15, 23-35, 44-54, 75-81 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marceau Milord whose telephone number is 571-272-7853. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2618

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MARCEAU MILORD

  
**MARCEAU MILORD**  
**PRIMARY EXAMINER**

Marceau Milord

Primary Examiner

Art Unit 2618